## REMARKS

Favorable reconsideration of the subject application, as amended above is respectfully requested in view of the comments below.

Claims 16, 18-20, 25, 33-35 and 39-42 are pending in the subject application.

Claims 19, 20, 34 and 35 have been rewritten in independent format, with no substantive changes thereto. These amendments are made merely to place the claims in condition for allowance, and are made at the Examiner's suggestion. Therefore, it is respectfully submitted that the amendments be entered.

### I. Objection to the Specification

In paragraph 4 of the Office Action the Examiner makes an objection to the "substitute specification filed August 12, 2003." Applicant has no record of having filed a substitute specification, nor does the record demonstrate any request from the Examiner for a substitute specification. Accordingly, it is believed that there is no need to file a substitute specification at this time.

### II. Claim Objections

It is respectfully submitted that the amendments to claims 19, 20, 34 and 35 render the objection to these claims moot.

### III. Rejection of Claims Under 35 U.S.C. § 112, Second Paragraph

Claims 16, 25, 33-35, and 38-42 stand rejected under 35 U.S.C. § 112, second paragraph. The Examiner asserts that the claims are indefinite because they do not recite the critical protective characteristics of the claimed polypeptides.

Applicant respectfully disagrees with the Examiner.

The claims set forth all of the critical features required under 35 U.S.C. § 112, second paragraph. The structure of the claimed polypeptide is provided and is related to the activity of the polypeptide. That is, only those polypeptides having the amino acid sequence of SEQ ID NO. 2 or those polypeptides that share 95% sequence similarity thereto AND which elicit a protective immune response are encompassed by the claims.

The specification provides the primary sequence of BVH-3 (SEQ ID NO:2) and sufficient information concerning the structure of this protein for one of skill in the art to use and manipulate the sequence. For example, Figure 11 provides sequence alignment of BVH-3 of six different isolates of *S. pneumoniae,* which provides guidance for making modifications to the polypeptide which are encompassed by the claims.

The specification also provides data demonstrating the immunoprotective properties of BVH-3 and polypeptide variants of BVH-3. Further, the specification discloses and exemplifies variants of BVH-3 wherein the variants have any one of the following: amino acid residue substitutions, modifications or deletions. (p. 24:22-24). The specification also teaches that preferred substitutions are those known in the art as conserved, *i.e.*, the substituted residues share physical or chemical properties such as hydrophobicity, size, charge or functional groups, (p. 24:25-28). The specification also indicates that procedures for making proteins with substitutions, deletions, and modifications are routine in the art and provides an assay for determining whether the protein variants are immunoprotective (Example 11, pp. 59-64; data in Table 8).

There is no requirement of 35 U.S.C. § 112 that the specification disclose the active site of a polypeptide, or in this case, the epitope or epitopes that convey immunoprotection. All that is required is a reduction to practice of a single species (SEQ ID NO:2) since the specification

indicates that the genus of polypeptides that are variants of SEQ ID NO:2 must also have the same activity, *i.e.*, confer immunoprotection, and must have at least 95% identity to SEQ ID NO:2. There is nothing vague or indefinite about these claim requirements since the structure of at least one polypeptide is provided, the activity is demonstrated and an assay for determining whether other claimed polypeptides have the required activity is provided. Thus, one of skill in the art would understand the necessary structure which is a common attribute of all members of the claimed genus.

The PTO has issued Guidelines governing its internal practice for addressing the issue of sufficiency of written description of protein variants. In its Guidelines, the PTO has determined that the written description requirement can be met by "show[ing] that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics . . . i.e., complete or partial structure, other physical and/or chemical properties, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics." Guidelines, 66 Fed. Reg. at 1106 (emphasis added). The Guidelines provide specific examples of polypeptides which meet the written description requirement, including an example of protein variants claimed in terms of sequence identity to a single disclosed species and claimed activity, where the active site of the polypeptide is unknown. Thus, under the Guidelines, the written description requirements are met for all of the claims of the present application since the functional characteristic of immunoprotection (activity) is coupled to a specific structure- SEQ ID NO:2 or 95% identity thereto.

Moreover, the specification provides several specific examples of polypeptides that share at least 95% sequence identity with BVH-3 (SEQ ID NO:2) and which elicit a protective immune response. For example, the specification teaches that SEQ ID NO:55, which includes

amino acids 21-1039 of BVH-3 provides a protective immune response when administered to animals (p. 54, Table 4; p. 58, Tables 6 and 7; p. 68. Table 9). Similarly, a polypeptide containing only amino acids 512-1039 of BVH-3 is immune protective, but a polypeptide containing amino acids 21-509 are not. This provides significant information concerning the location and structure of the immunoprotective region of the BVH-3 polypeptide, and indicates to one skilled in the art that the polypeptide can tolerate primary structural changes in the first 511 amino acids. Thus, the specification discloses the structure of exemplary species, and also provides guidance to one skilled in the art for determining where in the sequence of SEQ ID NO:2 additions, substitution and modifications may be made to retain activity of the polypeptide.

The specification also teaches that neither the amino-terminal methionine nor the signal sequence is necessary for immune function of the polypeptide, again providing structural information linked to the claimed activity of polypeptides having at least 95% sequence identity to SEQ ID NO:2. The specification also provides a table of several polypeptides having varying degrees of sequence identity with BVH3 that either confer immunoprotection or not, demonstrating where within the polypeptide variations within the amino acid sequence are tolerated. This information provides the practitioner with sufficient structural information concerning the BVH-3 polypeptide to generate other polypeptides having at least 95% sequence identity to SEQ ID NO:2 and which are immunoprotective.

A significant amount of structural information is provided in the specification and the skilled practitioner would understand the structural characteristics of the claimed polypeptides necessary to obtain polypeptides having the claimed function. Thus, the claimed invention meets the requirements of 35 U.S.C. § 112, second paragraph.

As such, the rejection of claims 16, 25, 33-35, and 35-38 under 35 U.S.C. § 112, second paragraph is respectfully traversed.

It is respectfully submitted that the present application is in condition for allowance, an early notification thereof being earnestly solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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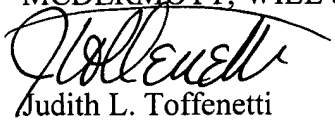

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